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**Proyecto Final: Redes Empresariales (ESNP)**

Documentation

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# Network Topology Documentation - Huawei eNSP

## Overview

This document details a Huawei enterprise network topology featuring multiple VLANs, routers, switches, and end devices. The network implements a hierarchical design with core routers, distribution switches, and access layer connectivity using Huawei networking equipment.

## Network Architecture

### Core Layer (Routers)

The network core consists of 6 routers providing inter-VLAN routing and WAN connectivity:

**Router Interconnections:**

* **ISP Router**: Central internet gateway
  + Connected to AR3, AR4, Router1, Router2
* **AR1**
  + Connected to: AR2, AR4, R4 Cisco (cloud)
* **AR2**
  + Connected to: AR1, AR3, AR4
* **AR3**
  + Connected to: ISP, AR2
* **AR4**
  + Connected to: ISP, AR1, AR2
* **Router1**
  + Connected to: ISP, LSW1
* **Router2**
  + Connected to: ISP, LSW2

### Distribution/Access Layer (Switches)

Four switches provide access layer connectivity and VLAN segmentation:

**Switch Infrastructure:**

* **LSW1**: Connected to Router1 and with LSW2, LSW3, LSW4, DHCP\_Server, DNS\_Server, PBX
* **LSW2**: Connected to Router2 and with LSW1, LSW3, LSW4, DHCP\_Server, DNS\_Server, PBX
* **LSW3**: Connected to LSW1, LSW2 and with PC1
* **LSW4**: Connected to LSW1, LSW2 and with Windows1

## Network Segmentation Analysis

### Point-to-Point Router Networks (/30 subnets)

Each /30 network connects exactly two router interfaces:

**156.0.10.16/30 Network:**

* AR2 (interface)
* AR3 (interface)

**156.0.10.0/30 Network:**

* AR3 (interface)
* ISP Router (interface)

**156.0.10.4/30 Network:**

* AR4 (interface)
* ISP Router (interface)

**156.0.10.12/30 Network:**

* AR2 (interface)
* AR4 (interface)

**156.0.10.20/30 Network:**

* AR2 (interface)
* AR1 (interface)

**156.0.10.8/30 Network:**

* AR1 (interface)
* AR4 (interface)

**192.10.6.0/30 Network:**

* AR1 (interface)
* R4 Cisco (cloud)

**177.0.10.0/28 Network:**

* ISP Router (interface)
* Router1 (interface)

**144.0.10.0/28 Network:**

* ISP Router (interface)
* Router2 (interface)

### VLAN Networks (End Device Networks)

**VLAN 10 Network (172.16.10.0/24):**

* PC1: **172.16.10.10**
* Name: VoIP

**VLAN 11 Network (192.168.10.0/24):**

* DHCP\_Server: 192.168.10.10
* Name: Ventas

**VLAN 12 Network (10.0.10.0/24):**

* Windows1: 10.0.10.10
* Name: IT

**VLAN 13 Network (10.1.10.0/24):**

* Name: Admin\_Equipos

**VLAN 18 Network (192.168.11.0/28):**

### Notes

* SW5 and SW6 are connected to the same end devices, this means there is only one dhcp server and so on

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* AR4 (interface)

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* R4 Cisco (cloud)

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* ISP Router (interface)
* Router2 (interface)

### VLAN Networks (End Device Networks)

**VLAN 10 Network (172.16.10.0/24):**

* Name: VoIP
* PBX device connected

**VLAN 11 Network (192.168.10.0/24):**

* PC1: 192.168.10.10
* Name: Ventas

**VLAN 12 Network (10.0.10.0/24):**

* Windows1: 10.0.10.10
* Name: IT

**VLAN 13 Network (10.1.10.0/24):**

* Name: Admin Equipos

**VLAN 18 Network (192.168.11.0/28):**

* DHCP\_Server: 192.168.11.10
* Internal management network

## End Device Assignments

### Server Infrastructure

* **DHCP\_Server**: 192.168.11.10 (VLAN 18)
* **DNS\_Server**: Connected to LSW2
* **PBX**: Connected to LSW2 (VLAN 10 - VoIP)

### Client Devices

* **PC1**: 192.168.11.10 (VLAN 11)
* **Windows1**: 10.0.10.10 (VLAN 12)

## Network Characteristics

### Design Pattern

* **Hierarchical Architecture**: Core routers (AR series + ISP) → Distribution (Router1/2) → Access (LSW switches)
* **Partial Mesh Core**: AR routers interconnected with selective redundancy
* **Full Switch Mesh**: Complete connectivity between LSW switches

### Router Roles

* **AR1, AR2, AR3, AR4**: WAN core routers providing inter-site connectivity
* **ISP Router**: Central gateway for external connectivity
* **Router1, Router2**: Distribution routers connecting to access layer
* **R4 Cisco**: External Cisco device (cloud connection)

### Switch Functions

* **LSW1, LSW2**: Primary distribution switches with router connections
* **LSW3, LSW4**: Access switches for end device connectivity

### Redundancy Features

* Multiple paths between core routers
* Dual distribution routers (Router1, Router2)
* Full mesh connectivity at access layer
* Cross-connections between all LSW switches

## Network Topology Summary

**Total Network Components:**

* 7 routers (6 Huawei + 1 ISP)
* 4 Layer 2/3 switches (LSW series)
* 5 VLANs with different organizational functions
* Multiple server and client devices
* External connectivity to Cisco equipment

**IP Addressing Scheme:**

* WAN networks: 156.0.10.x/30 series
* Router-to-switch: 177.0.10.0/28, 144.0.10.0/28
* VLAN subnets: Mixed addressing (10.x.x.x, 172.16.x.x, 192.168.x.x)
* External connection: 192.10.6.0/30

This topology demonstrates enterprise-grade Huawei network design with proper hierarchical structure, redundancy, and VLAN segmentation suitable for medium enterprise organizations with multi-vendor connectivity requirements.